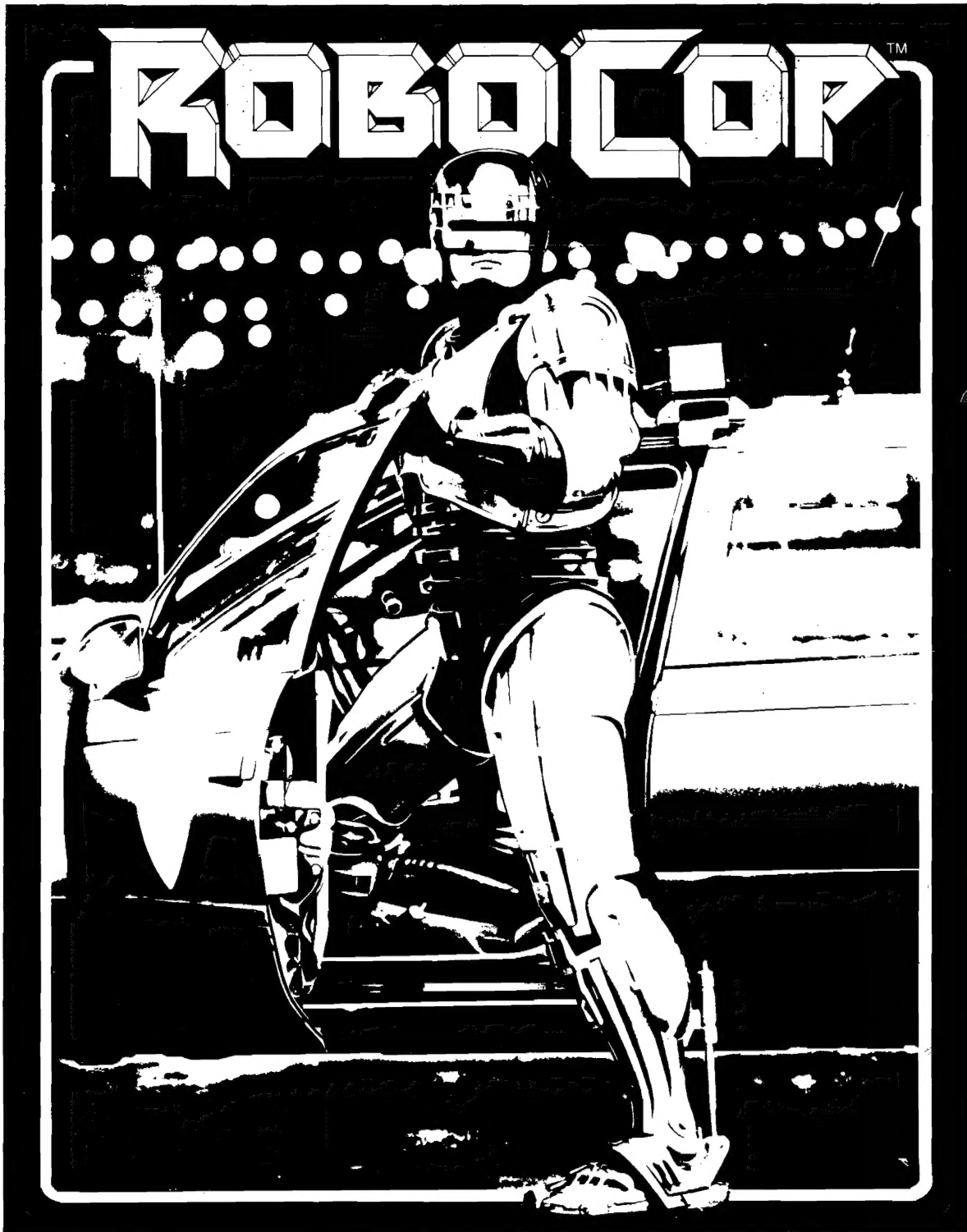


TECHNICAL SUPPORT MANUAL  
and Schematic Diagrams



DATA EAST USA, INC.

470 Needles Drive  
San Jose, California 95112  
Telephone (408) 286-7080

780-0116-00

### FCC WARNING

This equipment generates and uses radio frequency energy and if not installed and used properly, ie; in strict accordance with this instructions manual, may cause harmful interference to radio communications. This equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of the FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment.

Operation of this equipment in a residential environment is likely to cause interference in which case the user, at his own expense, will be required to take whatever measures are necessary to correct the interference.

### FBI WARNING

Federal law provides severe civil and criminal penalties for the unauthorized reproduction, distribution, or exhibition of copyrighted audio-visual works and video games. The Federal Bureau of Investigation investigates allegations of criminal copyright infringement.

### COPYRIGHT NOTICE

ROBOCOP™ is Copyright 1988 Data East Corporation, sold exclusively in the United States of America and Canada by Data East USA, Inc. All rights reserved.

### ENVIRONMENTAL DATA

This product is intended for use indoor use only, power requirements are 105-125 volts AC, 50-60 hz, and requires a 3 wire grounded outlet.

### SERVICE PROCEDURES

To obtain replacement parts and technical service, contact the authorized Data East Distributor in your area. If you require referral or further technical assistance, you may contact Data East's Customer Service department during the hours of 8:00 am to 5:00 pm Pacific Time at (408) 286-7074.

### AAMA WARNING

DATA EAST USA, INC., in cooperation with the American Amusement Machine Association, has installed an "AAMA PROTECT" certification label on each ROBOCOP PCB manufactured for legal sale in the United States of America.

If you are offered a ROBOCOP PCB that does not have the "AAMA PROTECT" certification label, you should suspect that the board is not legal, and should contact DATA EAST USA, INC., at (408) 286-7074, or Bob Fay of the AAMA at (703) 548-8044.

# **1. SYSTEM OVERVIEW**

---

The ROBOCOP™ Board Set consists of a Main CPU pcb (DE297) and a Game Program pcb (DE316), interconnected by two 96 pin connectors. The Main CPU pcb controls all graphics and sound functions, whereas the Game Program pcb contains all game specific Eproms and unique I/O circuitry.

**Graphics:** This game has 4 levels (or planes) of graphics; Moving Objects MIX (or Sprite character video), Back 0 (back-ground video), Back 1, and Back 2. The Back 2 plane is generated on the Game Program pcb and injected into the Main CPU pcb prior to the final video summing. Three BAC06 custom gate-array IC's control the three background video planes, and the MXC06 custom gate-array IC controls the Moving Object video plane.

**Sound:** The game sounds are provided by the Yamaha Sound sub-system, and has the capability to mix in sound from an outside source. In the case of ROBOCOP™, the outside source is the OKI Voice Synthesizer found on the Game Program pcb. The voice sounds are injected into the final amplifier on the Main CPU pcb via a 6 pin cable between the two pcbs. The 68000 cpu writes an 8-bit word to the 6502A Sound cpu, which is programmed to generate a unique sound. Again, all sound program and data storage is on the Game Program pcb.

**Input/Output:** The ROBOCOP™ Main CPU pcb contains 21 general purpose switch inputs, 2 dedicated Coin Switch inputs, 16 dipswitch inputs, 2 CPU controlled open collector outputs, and 2 dedicated Coin Counter open collector outputs.

## 2. PARTS LIST

---

### MAIN CPU PCB, DE-0297

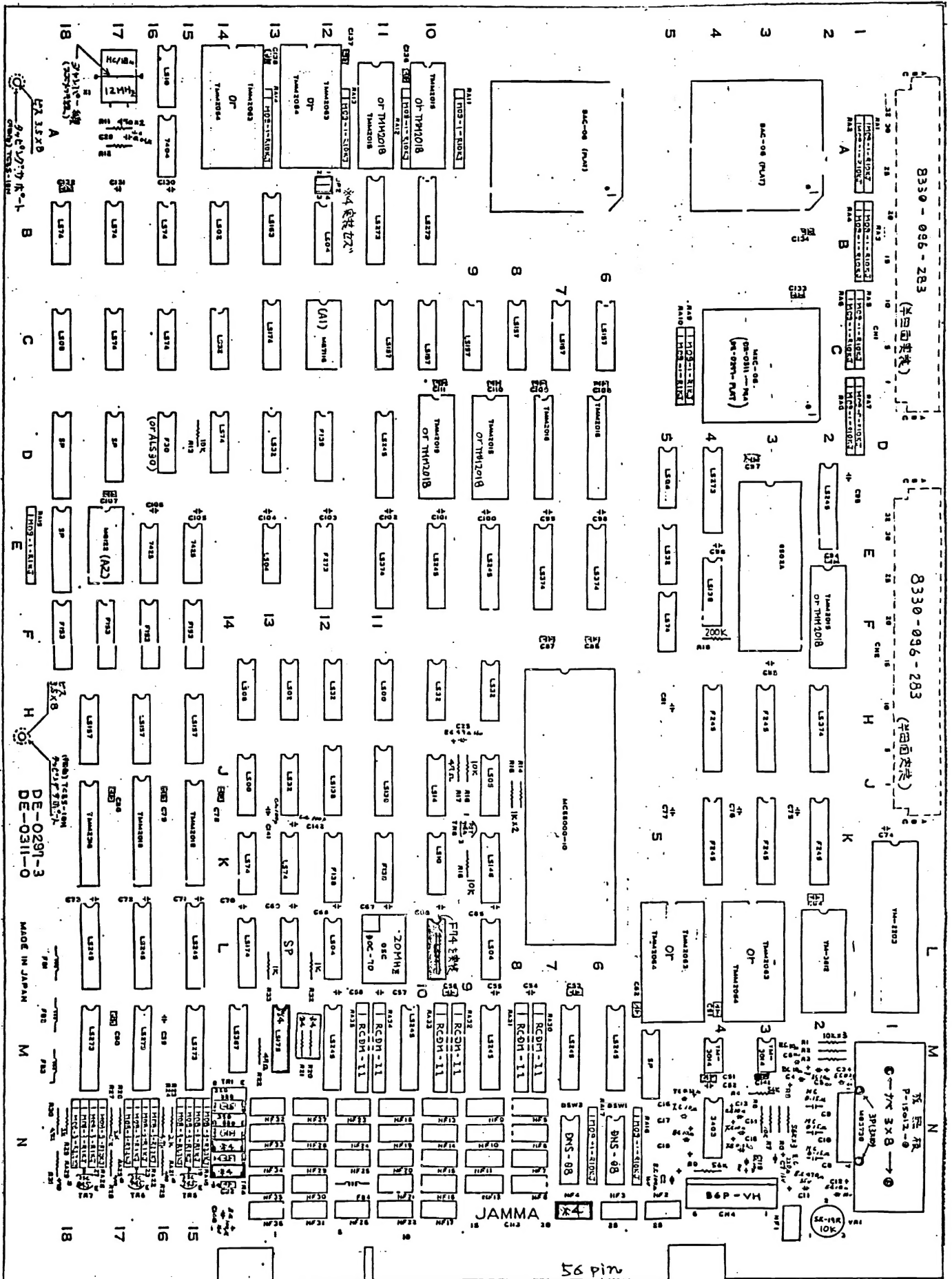
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TTL	74LS00	100-0025-00	2
TTL	74LS02	100-0026-00	2
TTL	74LS04	100-0027-00	5
TTL	74LS05	100-0005-00	1
TTL	74LS08	100-0028-00	2
TTL	74LS10	100-0029-00	2
TTL	74LS14	100-0030-00	1
TTL	74LS32	100-0034-00	7
TTL	74LS74	100-0037-00	10
TTL	74LS138	100-0042-00	3
TTL	74LS148	100-0044-00	1
TTL	74LS157	100-0046-00	9
TTL	74LS163	100-0049-00	1
TTL	74LS174	100-0051-00	2
TTL	74LS245	100-0058-00	12
TTL	74LS273	100-0060-00	6
TTL	74LS367	100-0062-00	1
TTL	74LS374	100-0064-00	4
TTL	74F30	100-0033-04	1
TTL	74F138	100-0042-04	2
TTL	74F139	100-0043-04	1
TTL	74F153	100-0045-04	4
TTL	74F273	100-0060-04	1
TTL	74F245	100-0058-04	5
CPU	MC68000-10	100-0232-00	1
CPU	6502A	100-0099-01	1
CUSTOM	BAC06, 144 PIN	100-0234-00	2
CUSTOM	MXC06, 132 PIN	100-0245-00	1
RAM	TMM2063-10	100-0081-00	4
RAM	TMM2015-10	100-0082-00	5
RAM	TMM2018-45	100-0035-00	5
LINEAR	YM-2203 OPN	100-0123-00	1
LINEAR	YM-3014 DAC	100-0179-00	2
LINEAR	YM-3812 OPL	100-0208-00	1
LINEAR	UA3403 (LM324)	100-0124-00	1
LINEAR	MB3730 PWR AMP	100-0081-00	1

MAIN CPU PCB, DE-0297

LINEAR	PST518	110-0065-00	1
XTAL	12 MHZ	140-0003-00	1
XTAL OSC	20 MHZ	140-0010-00	1
XISTOR	2SC945	110-0016-00	1
XISTOR	2SD880	110-0044-00	1
RESNET	RCDM-I1	100-0185-00	6

GAME PROGRAM PCB DE-0316-3

TYPE	DESCRIPTION	PART NUMBER	QTY
PROMS	27512	105-0080-00	24
CUSTOM	BAC-06	100-0234-00	1
CUSTOM	DEM-01	100-0257-00	1
CUSTOM	DEC-01	100-0256-00	1
LINEAR	6295	100-0248-00	1
LINEAR	4558	100-0084-00	1
RAM	2018	105-0035-00	3
TTL	74LS273	100-0060-00	6
TTL	74LS373	100-0111-00	2
TTL	74LS374	100-0064-00	1
TTL	74LS04	100-0027-00	2
TTL	74F32	100-0034-00	2
TTL	74F139	100-0043-04	1
TTL	74LS08	100-0028-00	1
TTL	74LS04	100-0027-00	1
TTL	74LS74	100-0037-00	1
TTL	74F74	100-0037-04	1
TTL	74LS390	100-0247-00	1
PAL	PY-1	105-0086-00	1
PAL	PY-0	105-0087-00	1
ROM	EN-24	105-0085-00	1



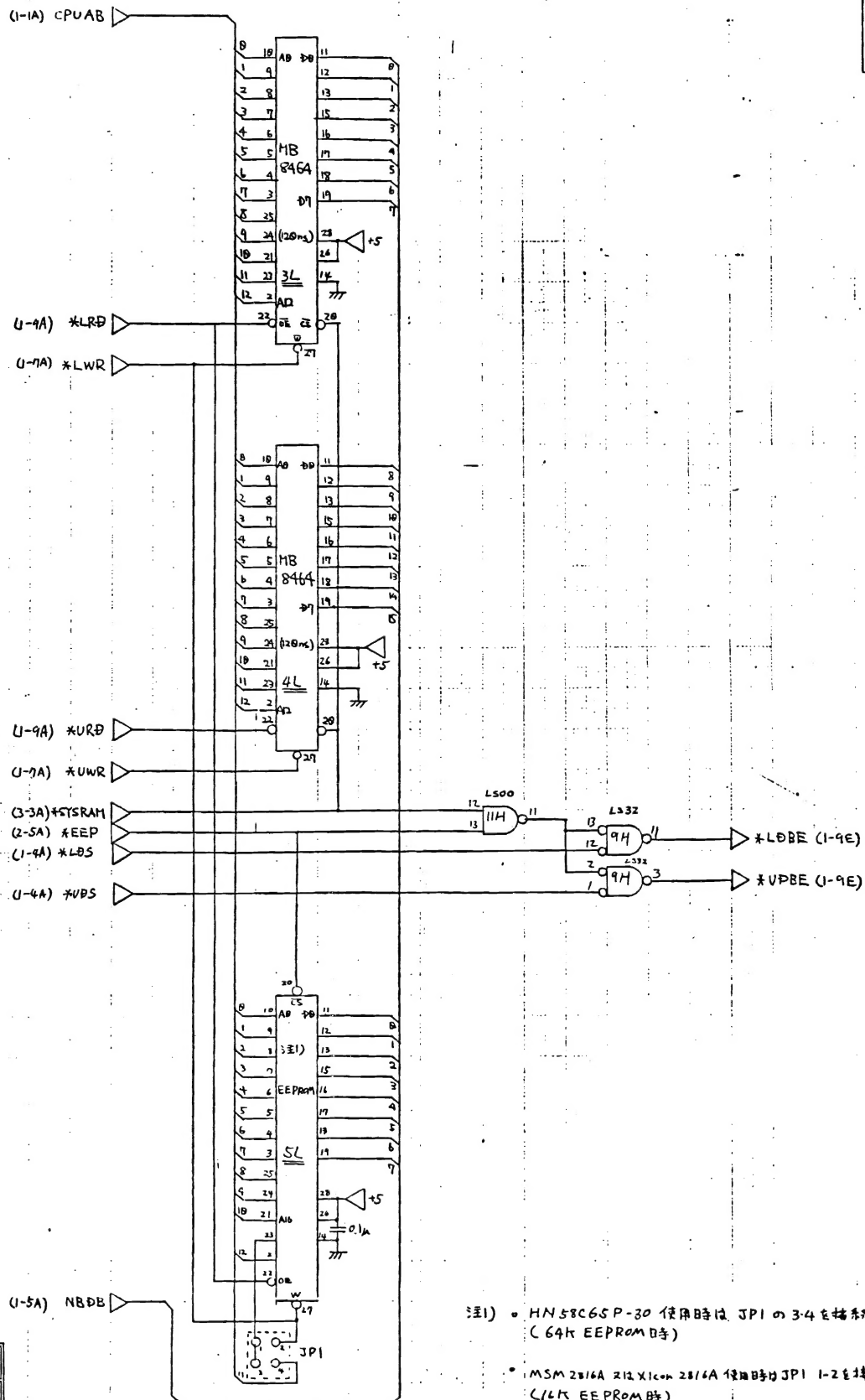








関連番号	仕様名称



注1) \* HN58C65P-30 使用時は JPI の 3-4 を接続  
(64k EEPROM 時)

\* MSM 2816A 212 X 1com 2816A 使用時は JPI 1-2 を接続  
(16k EEPROM 時)

記事

記号	年月日	改訂	欄	所	符号	部品	図面	番号	名称	仕様	材料
12.5.6	12.5.6	12.5.6	12.5.6	12.5.6	12.5.6	12.5.6	12.5.6	12.5.6	12.5.6	12.5.6	12.5.6

第3角法

DE-0297 PCB 4/17



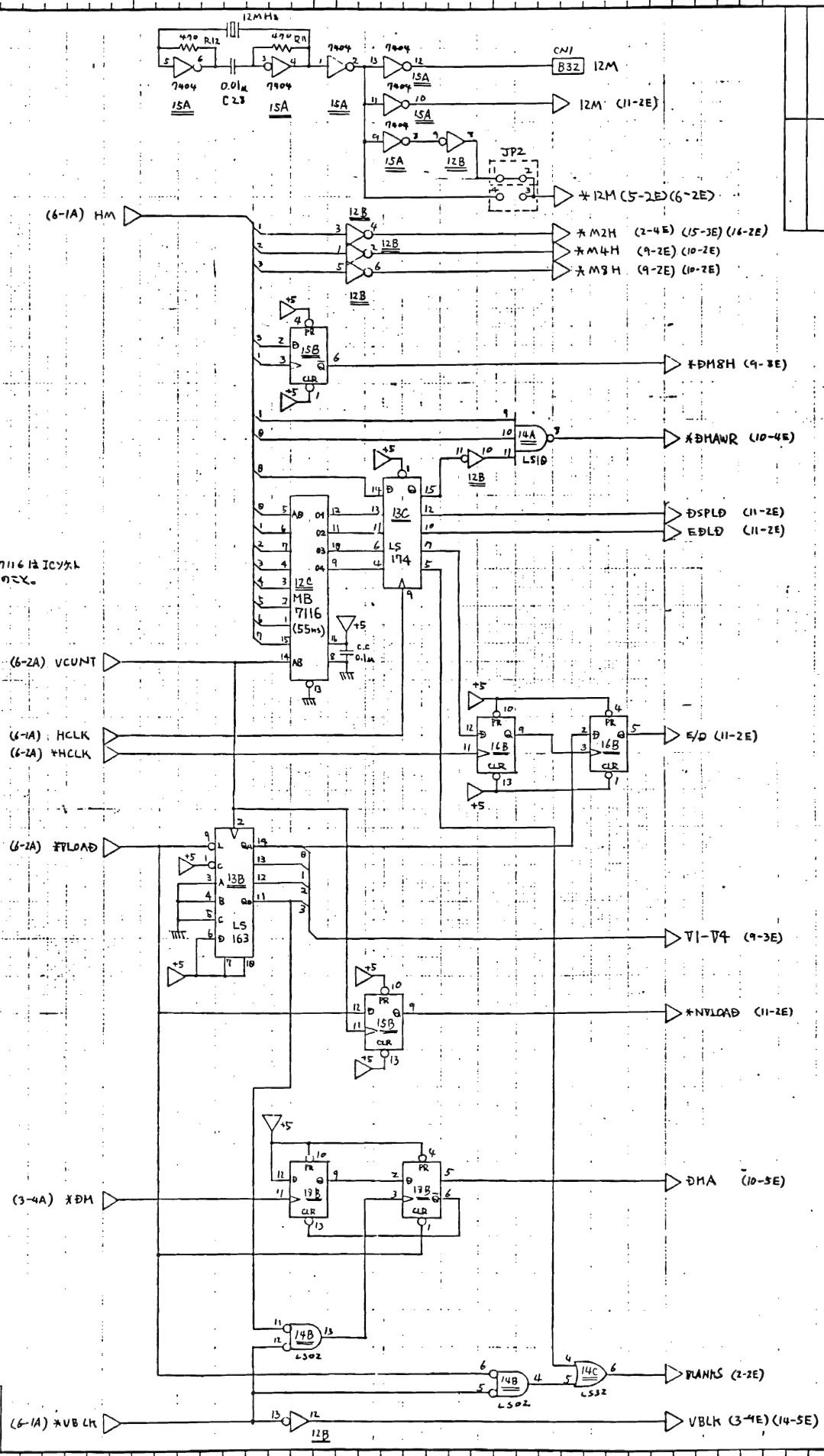
DE-0297 PCB 5/17

PAGE 10





関連番号 仕様名称



注) MB7116はIC出力  
保証のIC。

記号

記号	年月日	改訂	個所	符号	部品	図面番号	名称	仕様	材料
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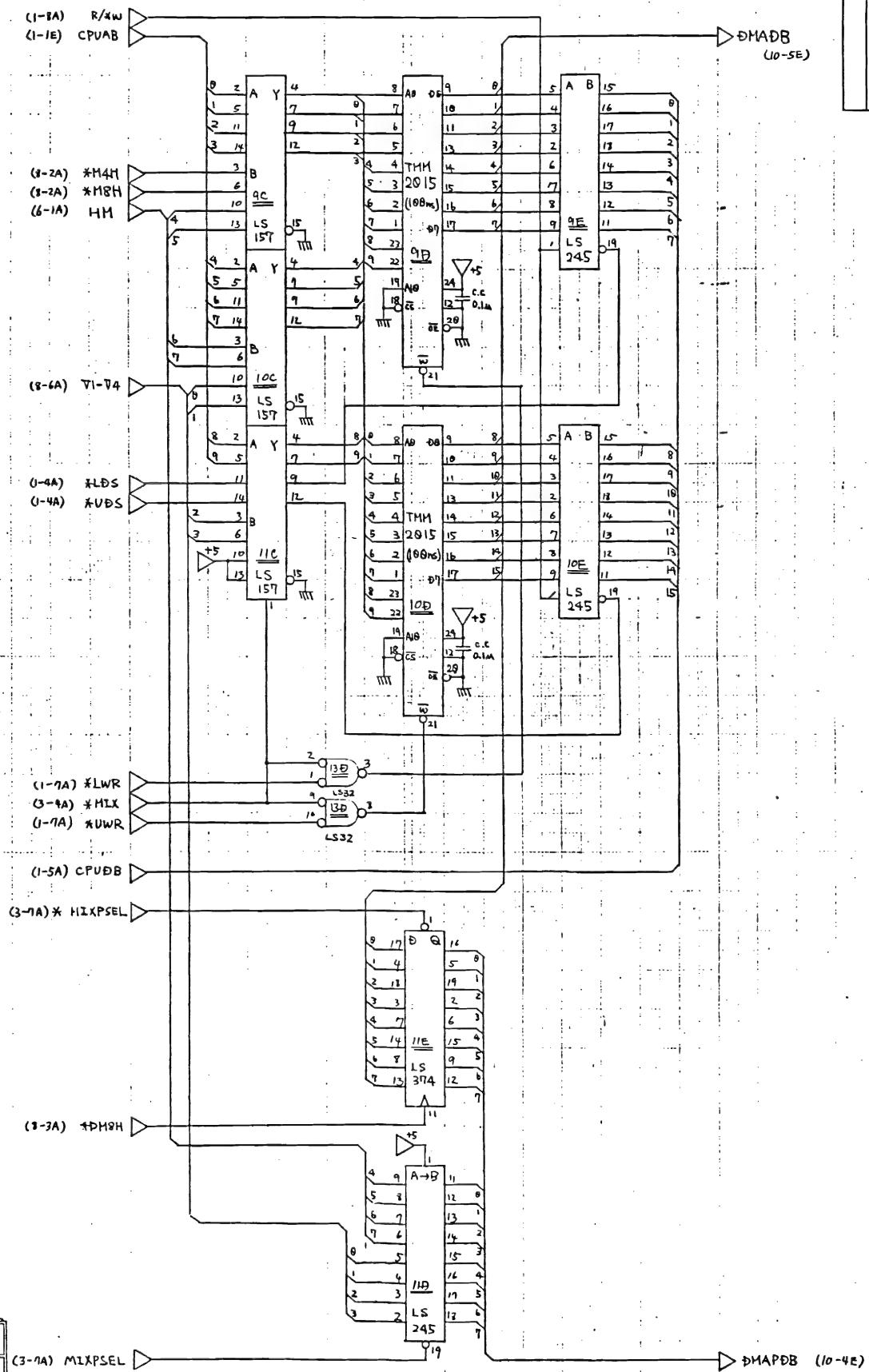
HFT-E1回路図

LK-1006C-1

第3角法

DE-0297 PCB 8/17

関連番号	仕様、名称



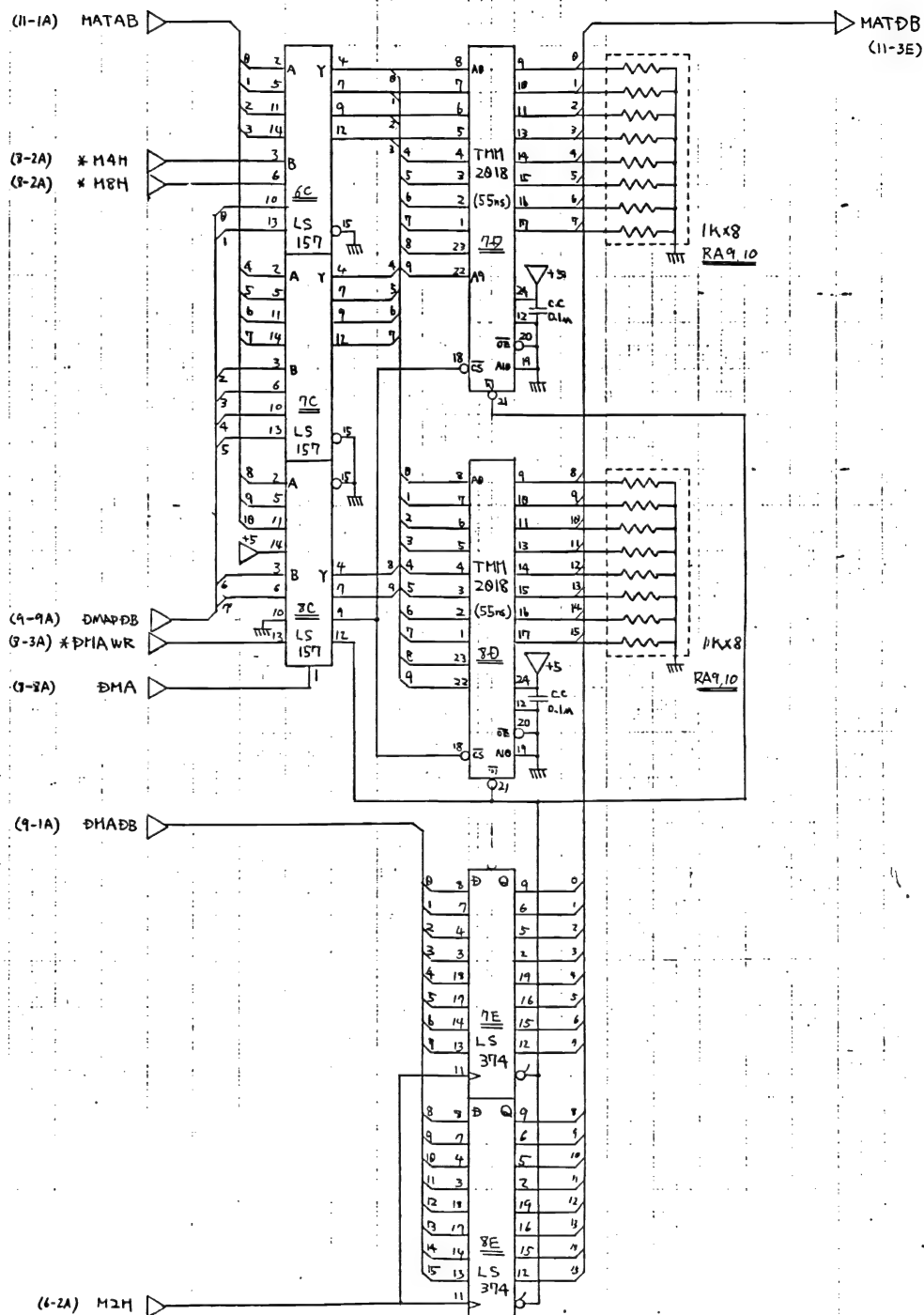
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承認	検出	検出	検出	検出	検出	検出	検出	検出	検出	検出	検出

第3角法

DE-0297 PCB 9/17

関連番号	仕様名称



第3角法

記号担当	年月日	改訂	個所	番号	部品	図面番号	名称	仕様	材料
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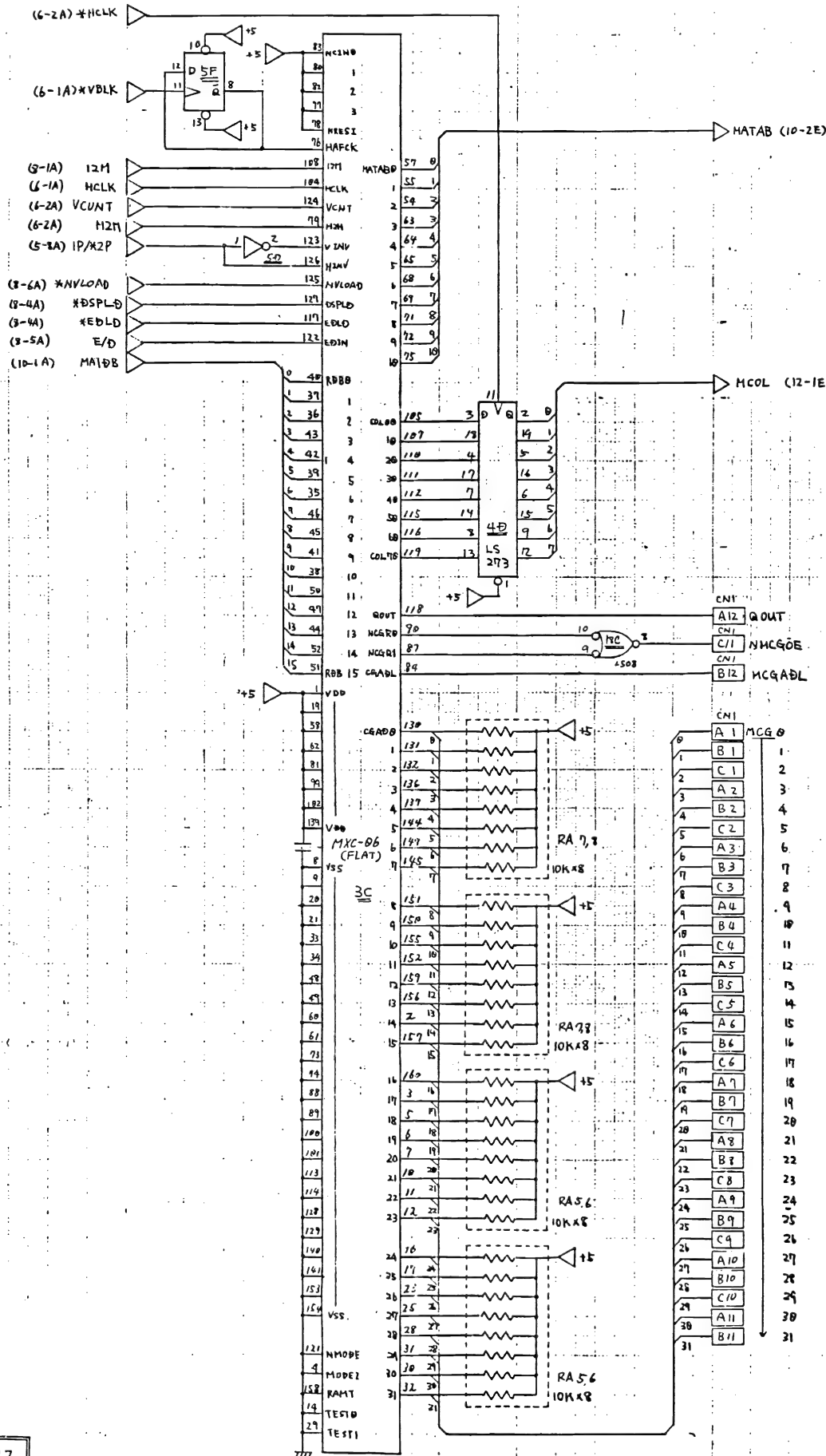
DE-0297 PCB 10/17

PAGE 15



関連番号	仕様、名称
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※注意 指示ピンはP1013、P1012、N.C.に付る。



第3角法

DE-0297 PCB 11/17

材料	年月日	改訂個所	符号	部品	図面番号	名称	仕様、材料
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承認	検図	検図	担当	公差	名称	(DE-0297) MXC-06 FLAT	HFT-E1 回装図
承認	検図	検図	担当	公差	名称	(DE-0297) MXC-06 FLAT	HFT-E1 回装図
承認	検図	検図	担当	公差	名称	(DE-0297) MXC-06 FLAT	HFT-E1 回装図
承認	検図	検図	担当	公差	名称	(DE-0297) MXC-06 FLAT	HFT-E1 回装図
承認	検図	検図	担当	公差	名称	(DE-0297) MXC-06 FLAT	HFT-E1 回装図
承認	検図	検図	担当	公差	名称	(DE-0297) MXC-06 FLAT	HFT-E1 回装図
承認	検図	検図	担当	公差	名称	(DE-0297) MXC-06 FLAT	HFT-E1 回装図

DE-0297 PCB 11/17

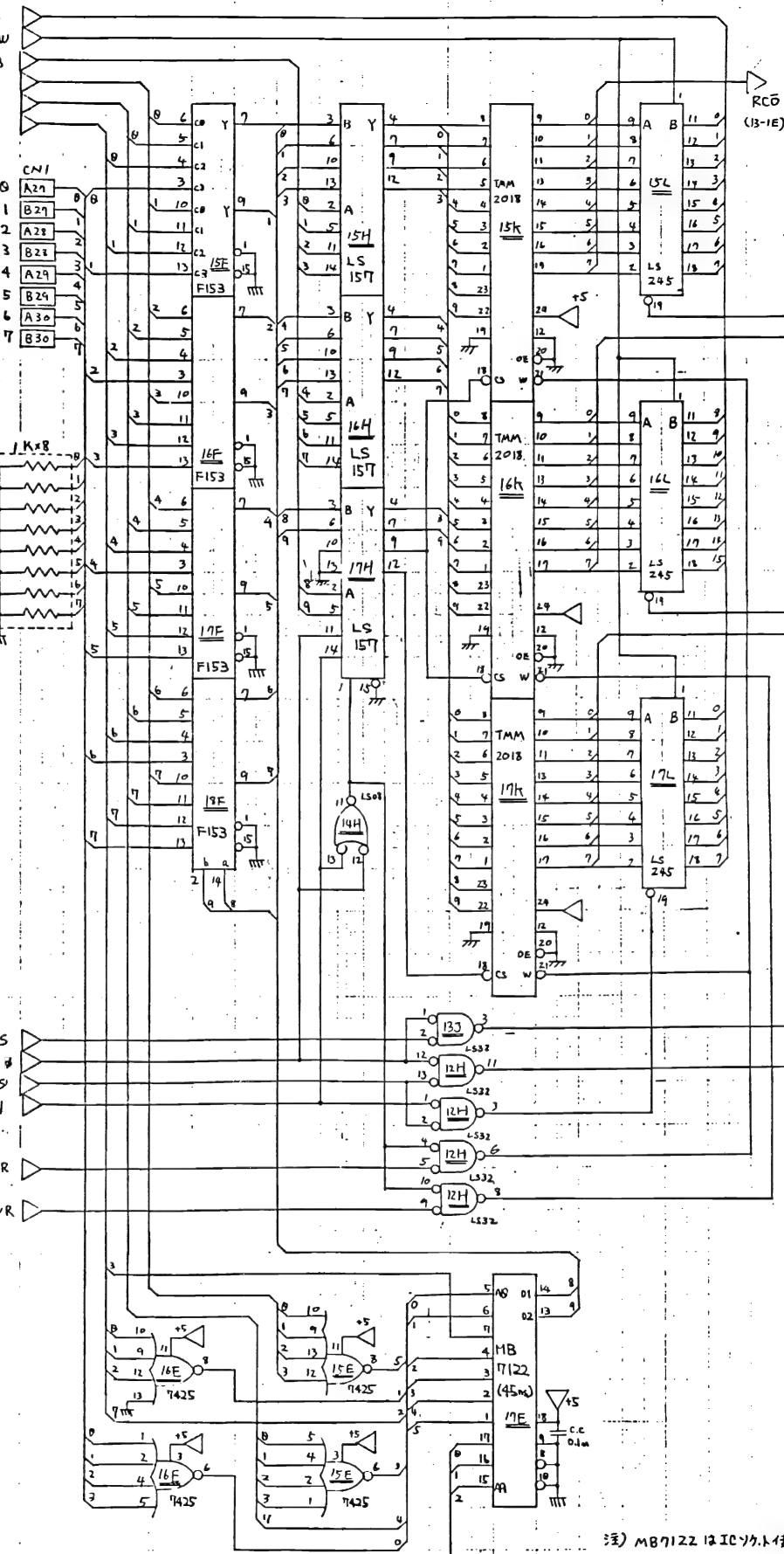
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B2COL

RA15

(1-4A) \*UD  
(3-3A) \*PSEL  
(1-4A) \*LD  
(3-3A) \*PSEL  
  
(1-7A) \*LW  
(1-7A) \*UW

(3-6A) PRISE



開運番号	仕様、名称
------	-------

• • •

•

注) M87122 は IC ソケット使用のこと。

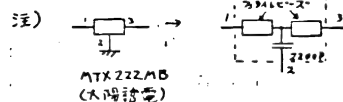
### 第3角法

1541  
テマヨ

DE-0297 PCB 12/17

PAGE 17



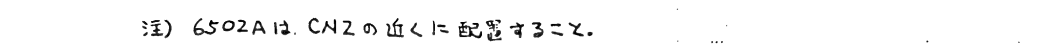


MTX 222MB  
(太陽誘電)

19

テマヨリ

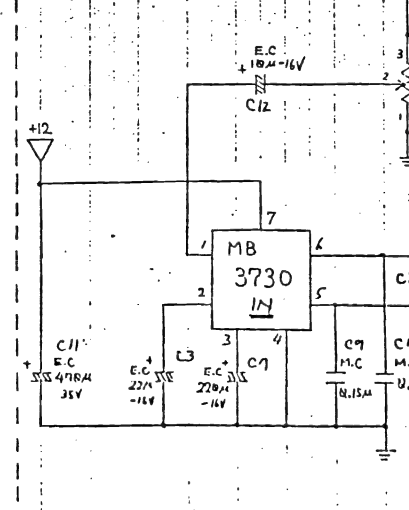
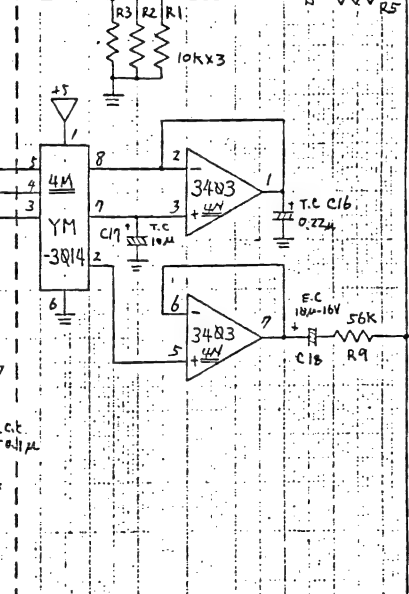
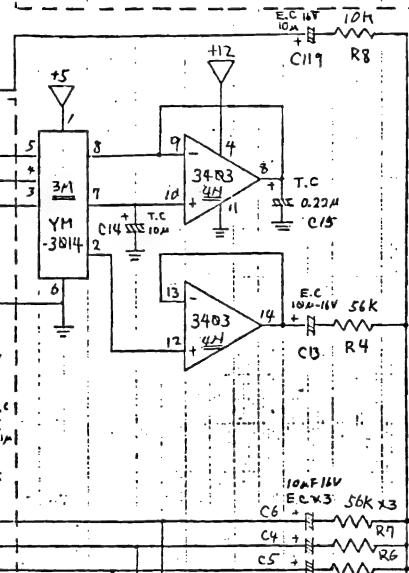
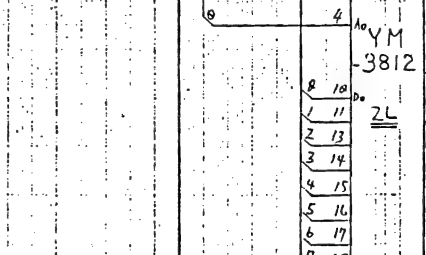
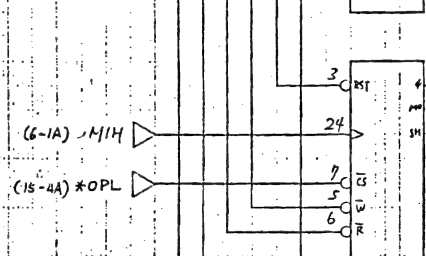
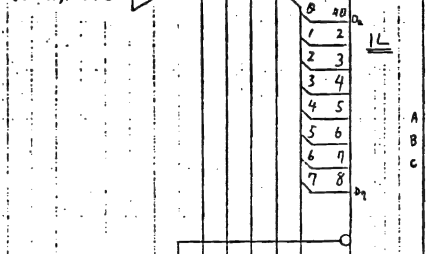
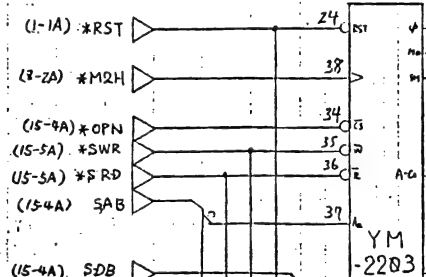
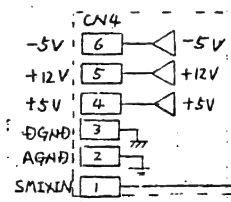
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Population	1,000,000	1,050,000	1,100,000	1,150,000	1,200,000	1,250,000	1,300,000	1,350,000	1,400,000	1,450,000	1,500,000	1,550,000	1,600,000	1,650,000	1,700,000	1,750,000	1,800,000	1,850,000	1,900,000	1,950,000	2,000,000	2,050,000	2,100,000	2,150,000	2,200,000	2,250,000	2,300,000	2,350,000	2,400,000	2,450,000	2,500,000	2,550,000	2,600,000	2,650,000	2,700,000	2,750,000	2,800,000	2,850,000	2,900,000	2,950,000	3,000,000	3,050,000	3,100,000	3,150,000	3,200,000	3,250,000	3,300,000	3,350,000	3,400,000	3,450,000	3,500,000	3,550,000	3,600,000	3,650,000	3,700,000	3,750,000	3,800,000	3,850,000	3,900,000	3,950,000	4,000,000	4,050,000	4,100,000	4,150,000	4,200,000	4,250,000	4,300,000	4,350,000	4,400,000	4,450,000	4,500,000	4,550,000	4,600,000	4,650,000	4,700,000	4,750,000	4,800,000	4,850,000	4,900,000	4,950,000	5,000,000	5,050,000	5,100,000	5,150,000	5,200,000	5,250,000	5,300,000	5,350,000	5,400,000	5,450,000	5,500,000	5,550,000	5,600,000	5,650,000	5,700,000	5,750,000	5,800,000	5,850,000	5,900,000	5,950,000	6,000,000	6,050,000	6,100,000	6,150,000	6,200,000	6,250,000	6,300,000	6,350,000	6,400,000	6,450,000	6,500,000	6,550,000	6,600,000	6,650,000	6,700,000	6,750,000	6,800,000	6,850,000	6,900,000	6,950,000	7,000,000	7,050,000	7,100,000	7,150,000	7,200,000	7,250,000	7,300,000	7,350,000	7,400,000	7,450,000	7,500,000	7,550,000	7,600,000	7,650,000	7,700,000	7,750,000	7,800,000	7,850,000	7,900,000	7,950,000	8,000,000	8,050,000	8,100,000	8,150,000	8,200,000	8,250,000	8,300,000	8,350,000	8,400,000	8,450,000	8,500,000	8,550,000	8,600,000	8,650,000	8,700,000	8,750,000	8,800,000	8,850,000	8,900,000	8,950,000	9,000,000	9,050,000	9,100,000	9,150,000	9,200,000	9,250,000	9,300,000	9,350,000	9,400,000	9,450,000	9,500,000	9,550,000	9,600,000	9,650,000	9,700,000	9,750,000	9,800,000	9,850,000	9,900,000	9,950,000	10,000,000



DE-0297	PCB	15/17
PAGE 20		

E-0297 PCB 15/  
PAGE 20

図面番号	仕様名称



※ 破線内は、グラウンドプレーンにすること。  
アンプのGNDは、エッジコネクタのPMTに接続すること。

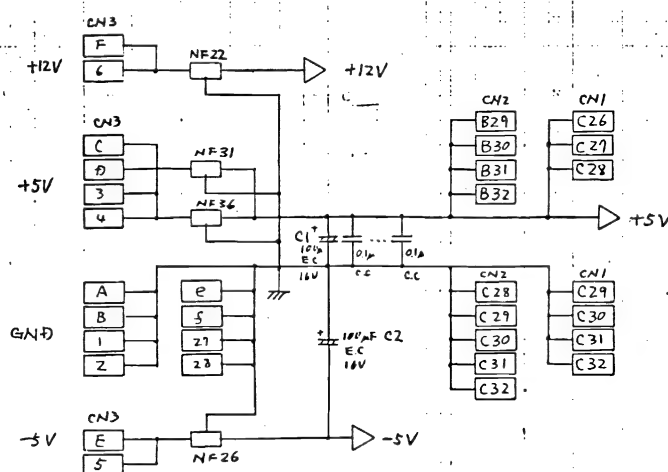
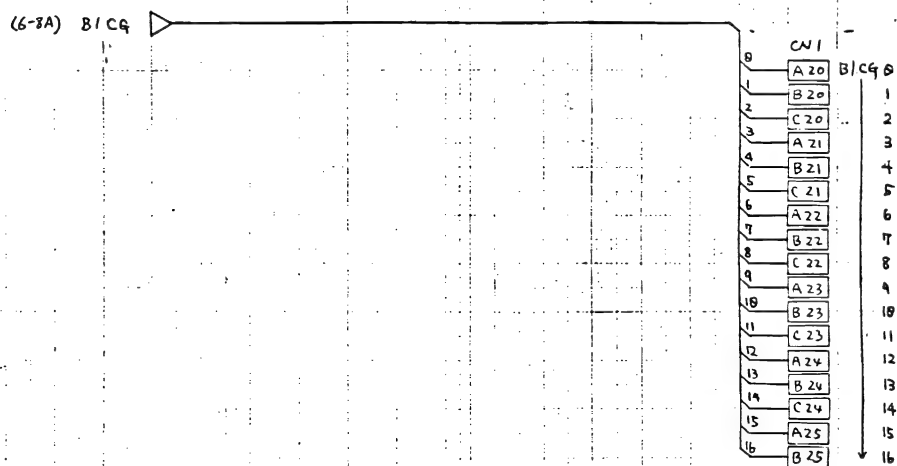
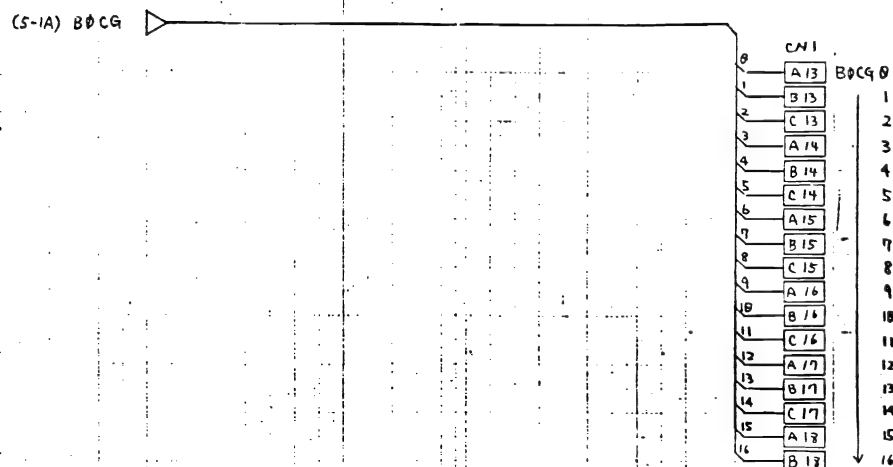
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材料	記号	年月日	改訂	個所	符号	部品	図面番号	名称
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電源	62.5.6							
接続	62.4.7							
組立	62.2.10							
公差								
単位	mm							
国産								
名称	HFT-E1 回路図							
仕様	LK-10060-1							

第3角法

データシート

開 連 番 号	仕 様, 名 称

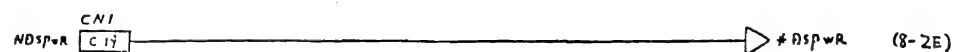
[illegible]

記

### 第3角法

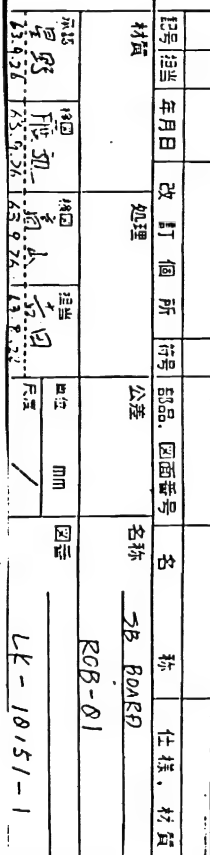
【附】

テグス



PAGE 23

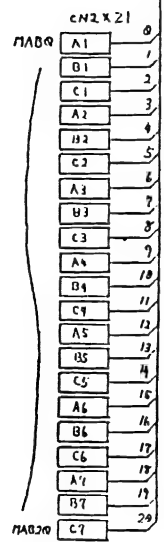




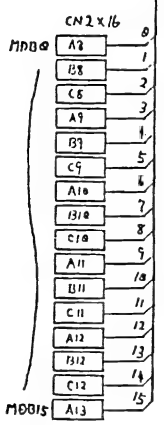
PAGE 24

材料	記号	担当者	年月日	改訂箇所	符号	部品	図面番号	名称	仕様	材料
材料	記号	担当者	年月日	改訂箇所	符号	部品	図面番号	名称	仕様	材料
材料	記号	担当者	年月日	改訂箇所	符号	部品	図面番号	名称	仕様	材料
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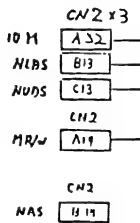
NOV 14 1988



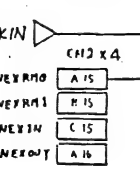
AB (5-1E, 8-2E, 11-2E)



DB (5-6E, 8-4E, 11-3E)



10M (11-7E, 14-1E)  
\*LNS (5-6E, 11-4E)  
\*UIS (5-6E)  
MRW (5-5E, 11-4E)



(11-7B) NDTACKIN

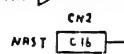
CN2 C14 NDTACKIN



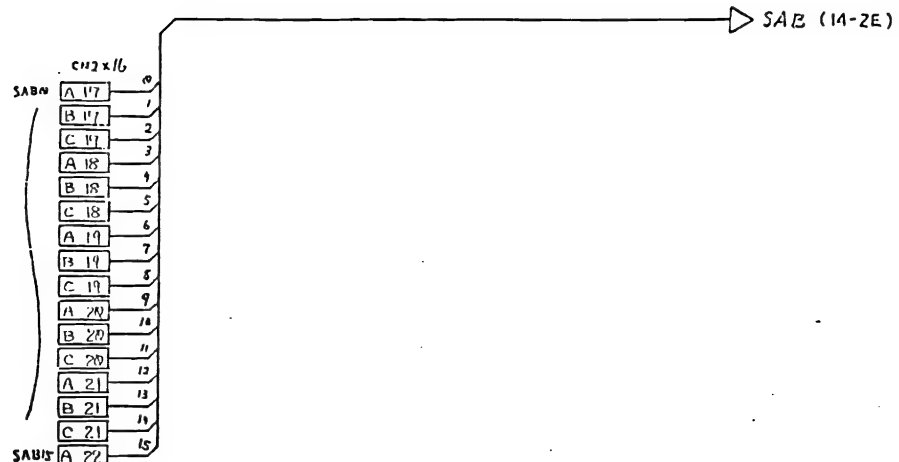
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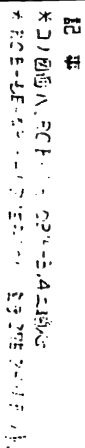
CN2 B16 NEXTRQ



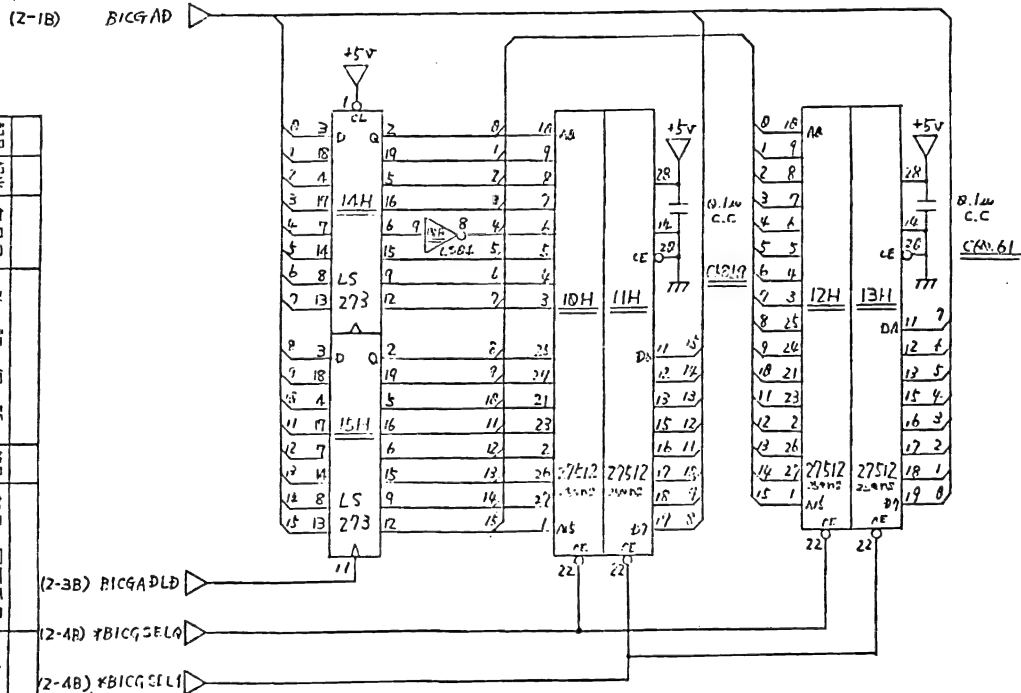
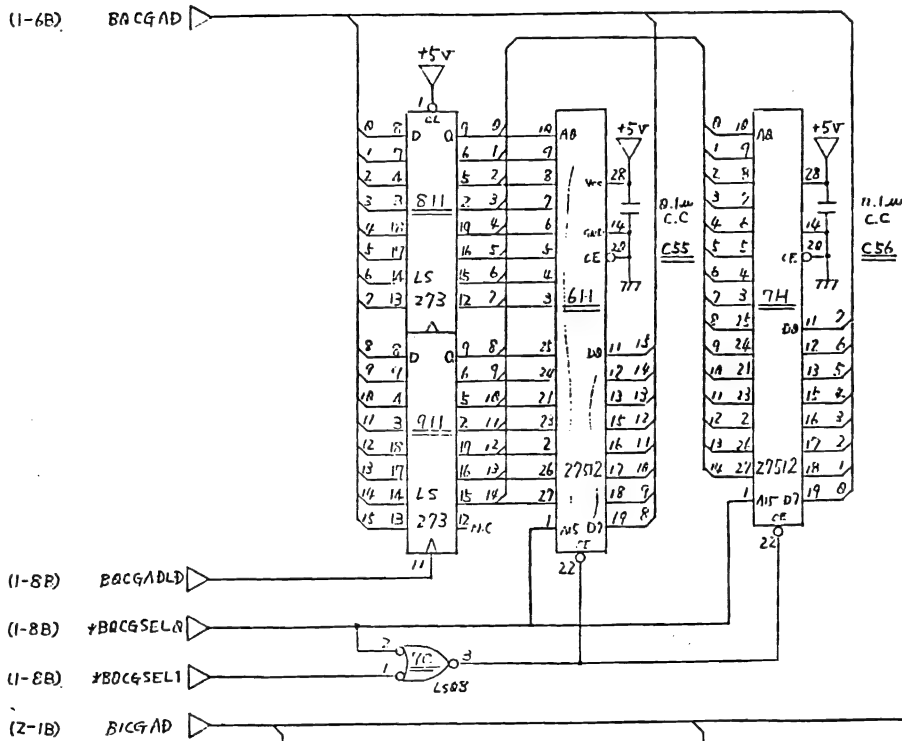
FRST (8-1E, 12-4E, 14-4E)





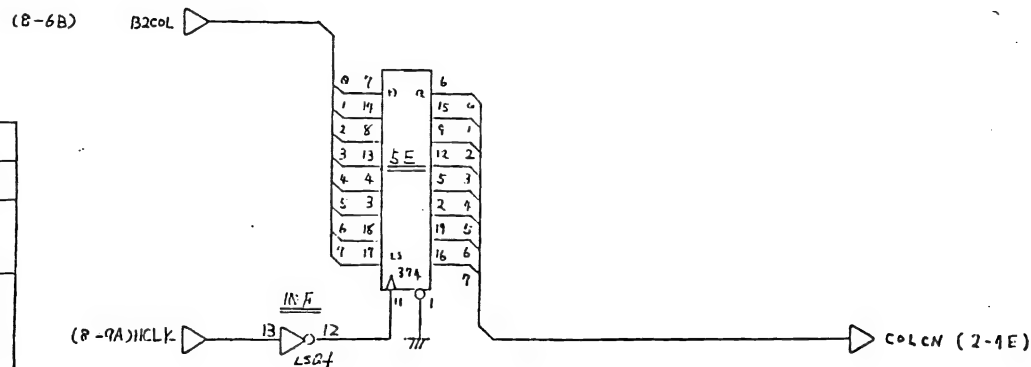


PAGE 28



記号	担当	年月日	改訂	個所	行号	部品	図面番号	名称	名	称	仕様、材質
材質	処理			公差		名称		SE SCARD			
ROB-01											
開発	設計	検出	組立	組立	組立	組立	組立	組立	組立	組立	組立
64.4.26	64.4.26	64.4.26	64.4.26	64.4.26	64.4.26	64.4.26	64.4.26	64.4.26	64.4.26	64.4.26	64.4.26
LK-14151-1											



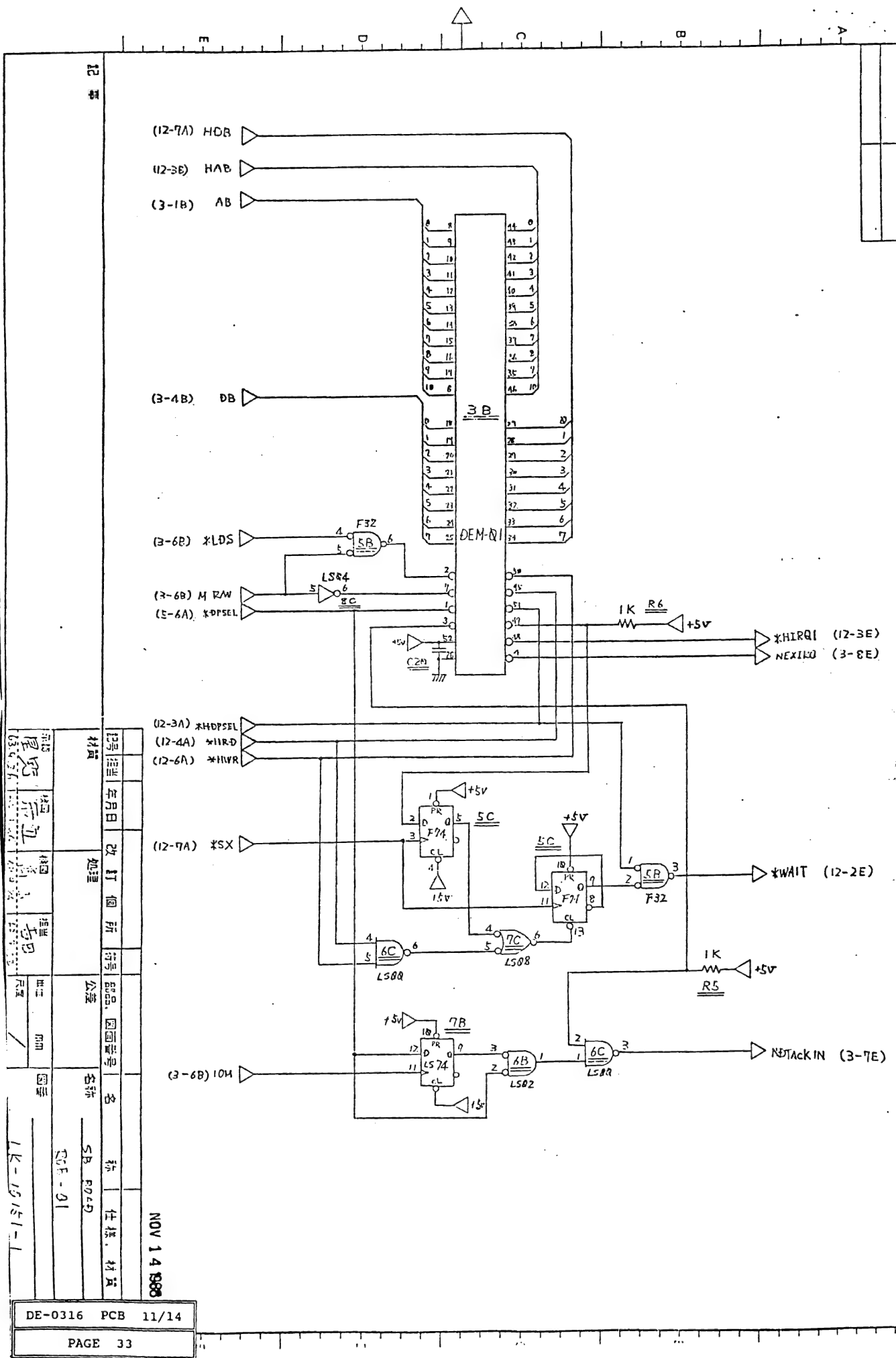
NOV 14 1964

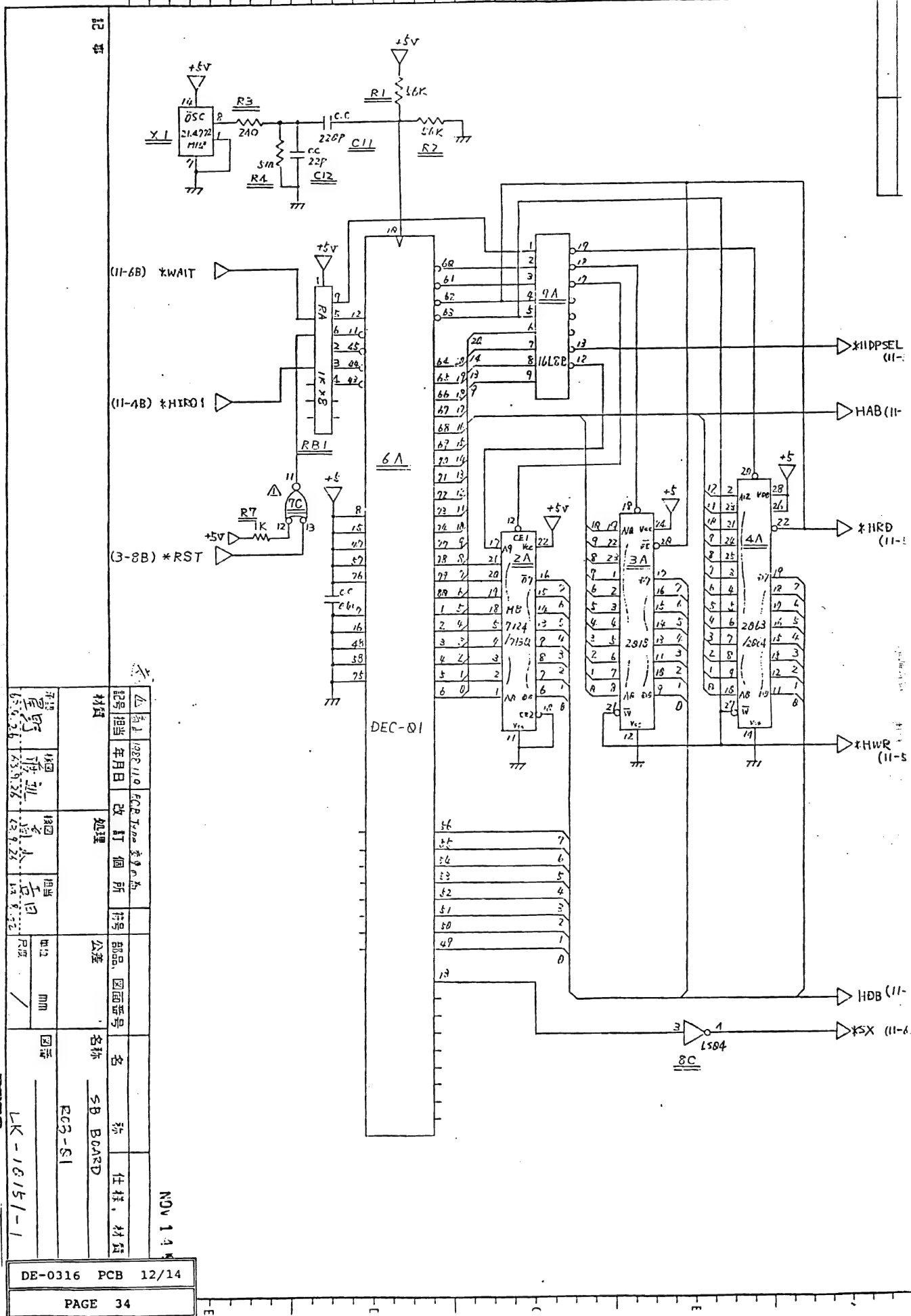


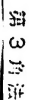


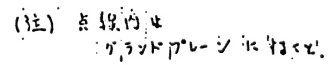
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PAGE 32





NOV 19

NOV 14

## 5. PCB EDGE CONNECTOR PIN-OUT

SOLDER SIDE	PIN #		PARTS SIDE
GND	A	1	GND
GND	B	2	GND
+ 5 V	C	3	+ 5 V
+ 5 V	D	4	+ 5 V
	E	5	
+12V	F	6	+12V
MISTAKEN INPUT PREVENTION	H	7	MISTAKEN INPUT PREVENTION
COIN COUNTER 2	J	8	COIN COUNTER 1
(GND)	K	9	(GND)
SPEAKER (-)	L	10	SPEAKER (+)
AUDIO (GND)	M	11	AUDIO (+)
VIDEO GREEN	N	12	VIDEO RED
VIDEO SYNC	P	13	VIDEO BLUE
SERVICE SWITCH	R	14	VIDEO GND
	S	15	
COIN SWITCH 2	T	16	COIN SWITCH 1
START SWITCH 2	U	17	START SWITCH 1
2 P CONTROL 1 UP	V	18	1 P CONTROL 1 UP
2 P CONTROL 2 DOWN	W	19	1 P CONTROL 2 DOWN
2 P CONTROL 3 LEFT	X	20	1 P CONTROL 3 LEFT
2 P CONTROL 4 RIGHT	Y	21	1 P CONTROL 4 RIGHT
2 P CONTROL 5 PUSH 1	Z	22	1 P CONTROL 5 PUSH 1
2 P CONTROL 6 PUSH 2	a	23	1 P CONTROL 6 PUSH 2
2 P CONTROL 7 PUSH 3	b	24	1 P CONTROL 7 PUSH 3
2 P CONTROL 8 SPARE 1	c	25	1 P CONTROL 8 SPARE 1
2 P CONTROL 9 SPARE 2	d	26	1 P CONTROL 9 SPARE 2
GND	e	27	GND
GND	f	28	GND

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Data East USA, Inc., ("Seller"), warrants only to the original purchaser ("Buyer"), of its products that the items listed below are free from defects in material and workmanship under normal use and service for the period specified:

**GAME LOGIC PRINTED CIRCUIT BOARD(S)**

**90 DAYS**

No other parts of the Seller's products are warranted.

Warranty periods are effective from date of initial shipment from Seller to Buyer. Seller's sole liability shall be, at its option, to repair or replace products which are returned to Seller during the warranty periods specified, provided:

1. Seller is notified promptly upon discovery by buyer that stated products are defective.
2. Such products are properly packaged and then returned freight pre-paid, to a place specified by Seller.

This warranty does not apply to products damaged during shipment and/or due to improper handling, or due to improper installation or usage, or alteration. In no event shall Seller be liable for any anticipated profits, loss of profits, loss of use, accidental or consequential damages, or any other losses incurred by the customer in connection with the purchase of a Data East USA, Inc., product.

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